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10/073,008	02/12/2002	Masayuki Hariya	389.41181X00	5084

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MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
1800 DIAGONAL ROAD
SUITE 370
ALEXANDRIA, VA 22314

EXAMINER	
OSBORNE, LUKE R	

ART UNIT	PAPER NUMBER
2123	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/073,008	HARIYA ET AL.	
	Examiner	Art Unit	
	Luke Osborne	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Status

1. Claims 17-20 are pending in the instant application.

Claims 17-20 stand rejected.

Applicants' arguments submitted 04/20/2007 have been fully considered, Examiners response is as follows.

Claim Objections

2. Claim 17 is objected to because of the following informalities:

Claim 17 contains the concept of preparing a model, which logically leads to the concept of having an "already prepared shape model" which is used in the claim and an unprepared model which is not used in the claim. The Examiner finds it difficult to determine the exact meaning of the term "preparing" and the difference between a prepared and an unprepared model in light of the usage in the claim and the description in the specification. Further, Applicant's arguments provide no further insight into what preparing means.

Appropriate correction is required.

Applicant's seek to clarify and overcome the objection to claim 17. Applicant's draw the Examiners attention to page 3, lines 1-6 of the specification which is reproduced below

> The present invention has an object to provide an analytical model preparing method and an analytical model preparing apparatus using means for saving user's template selecting operation by presenting a proper template from among a plurality of already prepared templates upon preparing an analytical model.

The Examiner appreciates Applicant's clarifying remarks, however the Examiner disagrees with the assertion that the exact meaning of the term "preparing" can be determined from the cited portion of Applicant's specification. The Examiner seeks clarification for the terminology used especially for finding the equivalents of Applicant's "means or step plus function" limitations.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Database Techniques for Archival of Solid Models by McWherter et al hereinafter "McWherter" in view of U.S.PG-Pub No. 2002/0042697 "Yamada" (previously cited).

Regarding claim 17, McWherter teaches an analytical model preparing apparatus comprising:

means for entering a shape model to be analyzed [Distance-based indexing and clustering will enable efficient retrieval of models that are similar to a given query model (The given model means that the reference must contain means for entering such a model to be analyzed) Page 78, column 2];

a database which maps each of a plurality of shape models previously made together with analytical mesh models corresponding to the shape models previously made [store a collection of CAD/CAM models in a database and perform efficient search and retrieval of these models (Page 80, Section 3)];

degree of approximation calculating means including [topological similarity assessment of solid models (Page 78, Abstract)]:

means for preparing associated information of shape elements by comparing shape elements in the shape model to be analyzed with the shape elements in the shape models previously made associating the shape elements in the shape model to be analyzed with the shape elements in the shape models previously made, [To this end, as described in Figure 1, we first construct a mapping from the boundary representation of solid models to a graph-based data structure that we call the Model

Signature Graph (The shape elements are represented in the data structure, this is used to query or associate as claimed the elements with each other) Page 80, Section 3, paragraph 2];

means for calculating a degree of approximation of the shape elements of the shape models previously made based on the number of shape elements of the shape model to be analyzed and the number of shape elements of the shape model previously made associated with the associated information of the shape elements [A primary goal of the distance metric is to ensure that two identical graphs have no distance between them. In addition, two graphs with only minor differences should consistently be measured relatively closely (page 81-82, Section 3.2 EigenDistance-Based Similarity)],

means for displaying sequentially the shape models previously made from larger to smaller degrees of approximation on a display screen[Figure 2 page 81], and

means for selecting, in response to an instruction, at least one of the shape models previously made from among said shape models previously made displayed [Figure 5 on page 83 shows the similarity matrix for the models in the study]; and

McWherter does not expressly teach that an analytical model (mesh) is prepared for the entered shape model. However, McWherter does teach that there is no significant restriction on the attributes stored in the vertices and edges in a MSG. The

selection to be used in applied systems will most likely be tailored to meet the needs of the particular application.

Yamada teaches not only that (analytical models) meshes are a typical feature of CAD or CAE applications and models [Yamada : 0005], and therefore would be an attribute that could be stored in a MSG. Further Yamada teaches analytical model preparing means [creating a mesh from a template mesh] for preparing an analytical mesh model of the shape model to be analyzed by use of attribute information prepared for the analytical mesh model corresponding to said shape model previously made selected. [Yamada: figure 9, Paragraphs 0078-0081] These paragraphs describe how a new mesh is generated for a changed (therefore similar) part using the similar part, improving the analytical model (mesh) if necessary.

It would have been obvious to a person of ordinary skill in the art at the time of Applicant's invention to combine the solid model database system of McWherter with the analytical model generation means.

The motivation to do so is found in Yamada paragraph 0006, which states that the automatically generated mesh may not be suitable for the analysis to be performed, and as figure 1 shows and paragraph 0036 teaches that a shape differing but similar the intent of the designer can still be captured. The combination as taught would allow the designer to have access to a multitude of similar parts available, which as Yamada teaches saves time.

Applicant's Argument

McWherter, which is merely directed to archiving solid models in a relational database management system, does not teach or suggest preparing associated information of shape elements, by comparing shape elements of an input shape model with shape elements of shape models in a template, as claimed.

Examiners Response

The Examiner has considered Applicant's argument to the extent that Applicant's arguments are based on claimed limitations and found them unpersuasive. The Examiner does not find the terms "input shape model" and "shape models in a template" in any claim.

In particular, the preparing associated information on the shape elements is taught as cited above. The transformation from the solid model to a model signature graph and beyond is preparing the shape model to be analyzed with all the other models that have also been prepared in this manner. The model signature graph as described on McWherter page 81 section 3.1 makes clear that the shape elements are represented in this model signature graph. If Applicant's believe that a shape element can not be represented as applied by the Examiner clarification from Applicant's specification is respectively requested.

Applicant's Argument

McWherter dies not teach preparing associated information of shape elements, in the manner claimed. Therefore it follows that McWhereter does not teach a means for

calculating a degree of approximation based on the shape elements of the shape model to be analyzed associated with the associated information of the shape elements. McWherter merely discloses techniques of spectral graph theory as a basis for approximating graph similarity among model signature graphs. This is not the same as means for calculating a degree of approximation of shape elements of the already prepared shape models based on the number of shape elements of the shape model to be analyzed associated with the associated information of the shape elements, in the manner claimed.

Examiner's Response

The Examiner has considered Applicant's argument and found them to be unpersuasive. Applicant's argument concludes that the reference cited is different then the limitations found in the claim. Applicant's arguments however provide no insight into how the claimed invention operates or has inherent functionality that distinguishes from the reference applied. Further Applicant's argument is unpersuasive since McWherter does teach preparing associated information of shape elements as previously discussed above. Furthermore the associated information is taught by McWherter on page 81, Section 3.1, 4th paragraph. In particular "There is no significant restriction on the attributes stores on the vertices and edges in a MSG. The selection to be used in applied systems will most likely be tailored to meet the needs of the particular application." and the 6th paragraph found on the same page left column "We believe that some attributes, such as the modeling features that are used to generate faces and

edges in the BRep, may be very important in the matching process during practical use."

Applicant's Argument

Approximating graph similarity among a set of template graph is quite different from calculation a degree of approximation of shape models previously made based on the number of shape elements of the shape model to be analyzed.

Examiners Response

The Examiner has considered Applicant's argument and found them to be unpersuasive. Furthermore, McWherter teaches that Vertex and Edge count are used for the comparing of models [Page 82, Section 3.3].

Applicant's Argument

There is no teaching or suggestion of the means for displaying sequentially the shape models previously made from larger to smaller degrees of approximation on a display screen.

Examiners Response

The Examiner has considered Applicant's argument and found them to be unpersuasive. McWherter teaches that Range queries and K nearest neighbor quires are specifically designed for his invention. The display of such a result from the queries is found on page 85 figures 3 and 4.

Applicant's Argument

There is no teaching or suggestion in Yamada of an analytical model preparing means for preparing an analytical mesh model, in accordance with the associated information of the shape elements between the shape elements in the shape model to be analyzed and the shape elements in the already prepared shape models in the manner claimed.

Examiner's Response

The Examiner has considered Applicant's argument and found them to be unpersuasive. Yamada teaches a mesh generating system as acknowledged by Applicant in the response on 8/25/2006 page 12. Figure 9, in Yamada shows the generation of a mesh model based on the characteristics of a template mesh. In the combination the template mesh is the selected mesh, this generation is then done in accordance with the information (shape elements) of the shape model.

Claims 18-20 are taught by the combination applied to claim 17, further in view of McWherter.

The claims recite where the approximation calculating means includes comparing

(claim 18) an intrinsic identifier [as best understood an intrinsic identifier is as defined in the instant specification paragraph 0059 as "Shape elements such as solid, surface, segment and point composing a shape model have a solid number, a surface

number, a segment number and a point number as intrinsic identifiers in the shape model" is taught by a topological identifier for the face (planar, conical, etc) page 81]

(claim 19) topological information [topological identifier for the face (page 81)]

(claim 20) coordinate values [edges of the graph (page 81)]

of the shape elements in the shape model to be analyzed with the one in the database. These features are taught by McWherter as shown above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luke Osborne whose telephone number is (571) 272-4027. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LRO

PAUL RODRIGUEZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100